Third United Nations International Conference on the Peaceful Uses of Atomic Energy

A/CONF.28/A/752
INDIA
February 1964
Original: ENGLISH

Confidential until official release during Conference

Abstract

A REVIEW OF URANIUM AND THORIUM DEPOSITS OF INDIA

K.L.Bhola, K.K.Dar, Y.N.Rama Rao,
C.Suri Sastry and N.R.Mehta.

Atomic Minerals Division,
Department of Atomic Energy

The Atomic Minerals Division of the Indian Atomic Energy Commission are engaged in a systematic nation-wide search for radioactive minerals. A number of uranium deposits have been located in the Pre-Cambrian rocks in different parts of the country.

The most important deposits are in the Archaean metasediments, in the generally east-west trending 140-kilometer long Singhbhum Thrust Belt in South Bihar (Eastern India), where the older Chaibasa and Iron Ore stages are thrust over the younger Dhanjori rocks.

Commercial deposits are confined to certain localities and appear to have been controlled partly by structure and by the physico-chemical characters of rocks, the siliceous-chlorite-schists, biotite-schists and quartzite-breccia being the most favoured hosts.

Exploratory core drilling aggregating some 65,000 meters in the belt has enabled underground development to be undertaken at Keruadungri, Marwapahar and Bhatin while at Jaduguda full scale mining operations have been launched for feeding the uranium mill. The ore potential of the belt is estimated at about 20-million tonnes of 0.05 - 0.07 percent eU_3O_8 grade. Further investigations which are underway are likely to augment the ore reserves making this belt the principal source of

uranium in India.

Pre-Cambrian rocks in Rajasthan also contain a few sporadic and smaller deposits. Recently promising indications of uranium have been discovered in the Pre-Cambrian of Kulu and early Palaeozoic of Garhwal in Central Himalayas. In all these cases, the deposits are associated more with copper than with lead, zinc or gold. The mineralisation is epigenetic and brought about by the hydrothermal action of fluids derived from high alkali magmas.

Most of the Indian granites and gneisses are radioactive due to disseminated uranium and/or thorium, chiefly the latter. Secondary uranyl minerals autunite, uranophane, bayleyite etc., occur in granites. Most pegmatites contain sporadic pockets of uranium and thorium minerals. Brecciated rhyolites with felsite intrusions occasionally show uranium mineralisation.

Except for insignificant amount of uranium, the terrestrial Gondwana sediments and some Tertiary coals and lignites, sedimentary rocks in India are devoid of uranium.

Thorium deposits are widely scattered. Monazite, the main thorium mineral which is derived from the granites and gneisses of the Peninsular Shield is concentrated along the Western and Eastern sea-board of India. There are some rich inland placers and the Jurassic sandstones of Cutch and Kathiawar which carry monazite.

Indian reserves of uranium (U_3O_8) and thorium (ThO_2) are estimated at about 30,000 tonnes and 0.5 million tonnes respectively, the latter being one of the largest in the world.